

# MAXWELL JONES

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I'm a Artificial intelligence and math double major at Carnegie Mellon University, graduating in 2023. I'm interested in AI/ML as well as software engineering.

## Skills

### PROGRAMMING LANGUAGES

Python  
Java  
C  
JavaScript  
HTML / CSS  
LaTeX  
SQL  
Julia

### TOOLS/Frameworks

NumPy  
Pytorch  
SciPy  
Unix Command Line  
Git  
Sklearn  
Keras  
Pandas  
Jupyter Notebook  
regex  
Matplotlib

### COURSEWORK

15-485 Intro to Deep Learning  
16-385 Computer Vision  
10-703 Deep Reinforcement Learning  
10-725 Convex Optimization  
10-315 Intro to Machine Learning  
15-281 Artificial Intelligence  
15-210 Parallel Algorithms  
15-213 Computer Systems  
21-484 Graph Theory  
15-251 Theoretical Computer Science

### HOBBIES/INVOLVEMENT

Origami  
Chess  
Basketball  
Kappa Sigma Fraternity

## Education

Carnegie Mellon University BS Mathematics 2023 BS Artificial Intelligence 2023 GPA: 4.0/4.0	Sept. 2019 to Current
Thomas Jefferson High School for Science and Technology High School Diploma 2019 GPA: 4.1/5.0	Sept. 2015 to May 2019

## Employment

Meta   FAIR Labs Software Engineer/Machine Learning Intern	May 2022 to Current
<ul style="list-style-type: none"><li>Working on paper to systematically benchmark algorithmic <b>Bias Amplification</b> of models from biased datasets with different levels of bias</li><li>Measuring how the affects of a a specific feature in an image(ex: grass versus snow) may affect classification of an object(ex: dog versus wolf)</li><li>Using <b>ResNet-18</b> using <b>ClassyVision</b> and <b>Pytorch</b> to benchmark bias for controlled subsets of <b>The Visual Genome</b> dataset</li><li>Specifically, creating custom biased datasets, running experiments, and <b>Cleaning Data</b> for <b>Image Classification</b></li><li><b>Lead Team Meetings</b> every week with respect to the project, specifically peers and co-authors on <b>Computer Vision</b> FAIR team</li></ul>	

Meta   Probability and Uncertainty Software Engineer Intern	Remote May 2021 to Aug. 2021
<ul style="list-style-type: none"><li>Developed a data perturbation training/evaluating/testing pipeline in <b>Python</b> for the Probability: Uncertainty team, leveraging <b>Pytorch</b> for main testing</li><li>Tested on probabilistic models including <b>Bayesian</b>, <b>Ensemble</b>, and <b>Dropout</b> focused networks modeled off of <b>LeNet-5</b> for performance</li><li>Measured how well these probabilistic models performed on perturbed image data(<b>Random Cropping</b>, <b>Rotation</b>, <b>Jittering</b>) w.r.t non-probabilistic models</li><li>Created visualizations using <b>Matplotlib</b> for presentation</li><li>Specifically focused on <b>MNIST</b> and <b>FashionMNIST</b> datasets, comparing different model architectures</li></ul>	

Carnegie Mellon University (Head) Teaching Assistant	Fall 2020 to Current
<ul style="list-style-type: none"><li>Teaching Assistant for 15-251 Theoretical Ideas in Computer Science, head TA for 15-151 Concepts of Mathematics (Spring and Fall, respectively)</li><li>Teach 20-student recitation twice per week, host office hours, and lead review sessions</li><li>Design/Lead staff meetings, coordinate TA-Professor interactions, <b>delegate TA responsibilities</b> for Concepts</li><li>Help <b>design exams</b>/update problem sets, <b>update course structure</b> for Concepts</li></ul>	

Fiat Chrysler Automobiles Data Science Intern	Remote May 2020 to Aug. 2020
<ul style="list-style-type: none"><li>Tasked to increase accuracy for absentee worker prediction at all plants (absentee predictions inform numbers for necessary temp workers)</li><li>Improved performance by using <b>Random Forests</b>, cross referencing crew attendance across plants</li><li>Queried data from <b>PostgreSQL</b> database and used <b>Pandas</b> library to store query results</li><li>Optimized the HR absentee prediction model in Python resulting in a <b>2% increase in accuracy</b></li></ul>	

## Projects

Semi Supervised Learning Research, Carnegie Mellon University	Fall 2021 to Current
<ul style="list-style-type: none"><li>Currently working on research in scalable graph-based Semi-Supervised Machine Learning project with PHD student under Dr. Nina Balcan</li><li>Using <b>Python</b> and <b>SciPy</b>, finding <b>Harmonic Objectives</b>, leveraging <b>K-Nearest Neighbor</b> graphs and iterative solvers for speedup</li><li>evaluating on <b>MNIST</b>, <b>CIFAR</b>, and common <b>NLP</b> datasets such as 20-newsgroups dataset with <b>Sklearn</b> using <b>Bag of Words</b> approach</li><li>Achieved <b>same accuracy</b>, <b>100x speedup</b> on large graphs with respect to closed form solutions with matrix inverses</li><li>Used <b>Image Embeddings</b> from layer 2 of <b>Resnet-18</b> adapted for CIFAR in order to clean up more difficult image classification problem before iterating</li></ul>	
Battlecode (codebase)	Jan. 2022
<ul style="list-style-type: none"><li>Worked on team of 4, coding an AI bot in <b>Java</b> to compete in a tournament run every year by MIT</li><li>Leveraged <b>distributed</b> communication <b>algorithms</b> and <b>pathfinding</b> to increase bot's effectiveness</li><li>Implemented <b>bit packing</b> methods, data structures such as <b>Priority Queues</b> and <b>Stacks</b>, and <b>K-Means Clustering</b> to improve performance</li><li>Placed top 10 out of 250 teams internationally(2021, 2022), 1st out of all first-time teams(2021)</li></ul>	
TartanHacks: Spot your Mood! (codebase)	Feb. 2021
<ul style="list-style-type: none"><li>Created an add on for <b>Spotify</b> using <b>Python</b> and <b>Flask</b> on team of 4 to track mood of users listening over time, as well as mood of specific playlists</li><li>Developed <b>Vector Embeddings</b> for mood based on <b>Spotify API</b> metadata and sentiment analysis</li><li>Used <b>Euclidean Distance</b> in the <b>Embedding Space</b> to execute recommendation decisions</li><li>Functionality for both song and playlist generation based on mood factors and specific genres that users liked</li><li>Developed graphs of mood over time based on users past listening</li></ul>	
TartanHacks: WalkSafe! (codebase)	Feb. 2020
<ul style="list-style-type: none"><li>Developed a Python program on team of 4 that calculates safe and efficient walking paths at night in New York City</li><li>Created a weighted graph from crime and street data and implemented an <b>A* Pathfinding</b> algorithm to generate optimal paths</li><li>Integrated <b>Open Street Map API</b> and fetched data from NYPD crime database REST endpoint</li></ul>	